

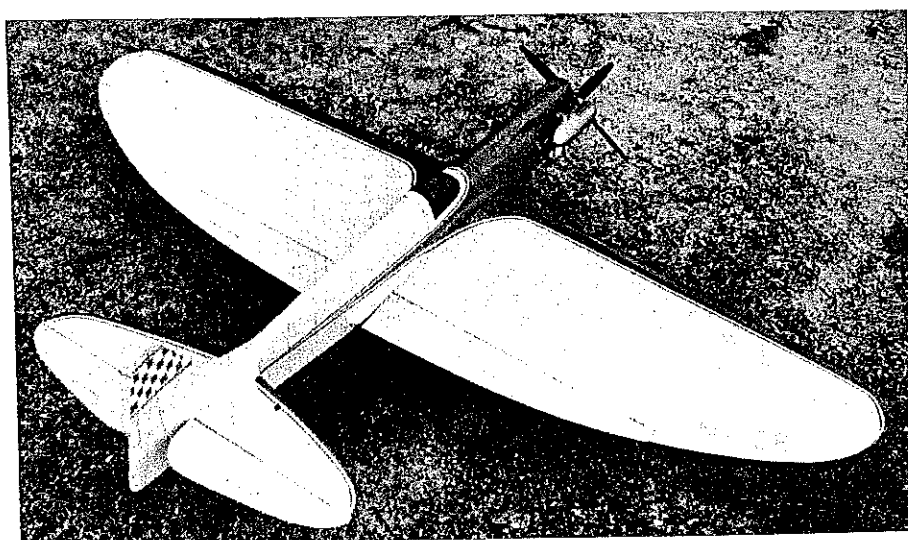
Original Veco ■ Tom Dixon *6277*
Thunderbird

“From the first flight it worked fine. Each flight demanded another and another.” Bob Palmer’s classic Veco Thunderbird continues to provide a special kind of Stunting pleasure. Here it is in the original and in our author’s updated version.

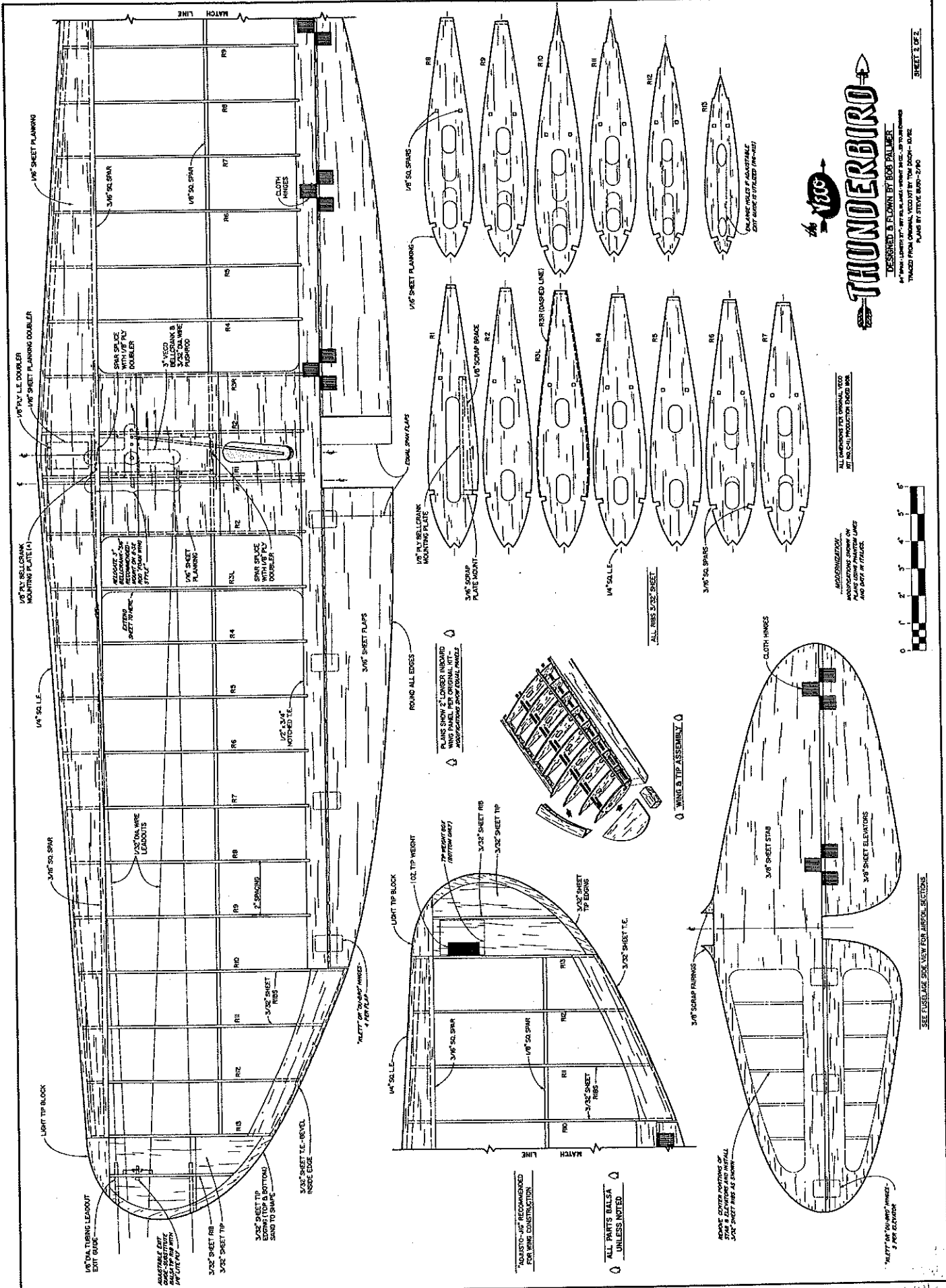
SINCE 1983, as regular readers of *Model Aviation* know, I’ve been flying and publishing various modifications and updates of Bob Palmer’s designs. It was at that time that I came to feel as though I’d gone about as far as I could with the various Nobler-derived designs. I was looking for something classic—something that would get me away from the then-current idiom of Stunters exemplified by the Stiletto, Genesis, and other Jet-type designs. Bob Palmer’s designs, most of which were kitted by Veco, proved to be just the ticket—timeless in their aesthetics but also Nats winners.

The Thunderbird design was never published (in any version). Instead it went directly into production as a kit. Curious, I wrote to Bob in an effort to learn just how he happened to come by the design. Here’s what he had to say:

“I went to work for Lockheed in 1951 and at the same time built the Smoothie. I designed its wing and airfoil to help it fly in the wind.



Its elliptical tip shape and airfoil were based on the classic lines of the British Spitfire, and then the fine tuning began. The result: a tight-turning, smooth-flying beauty of a Stunter. Four-bladed Bolly prop and stock Magnum muffler give more usable thrust, less speed buildup and wonderfully quiet flight.



Y100 THUNDERBIRD

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 UNLESS SHOWN OTHERWISE
 THUNDERBIRD PLANS BY STOVE BIRD-2/P10

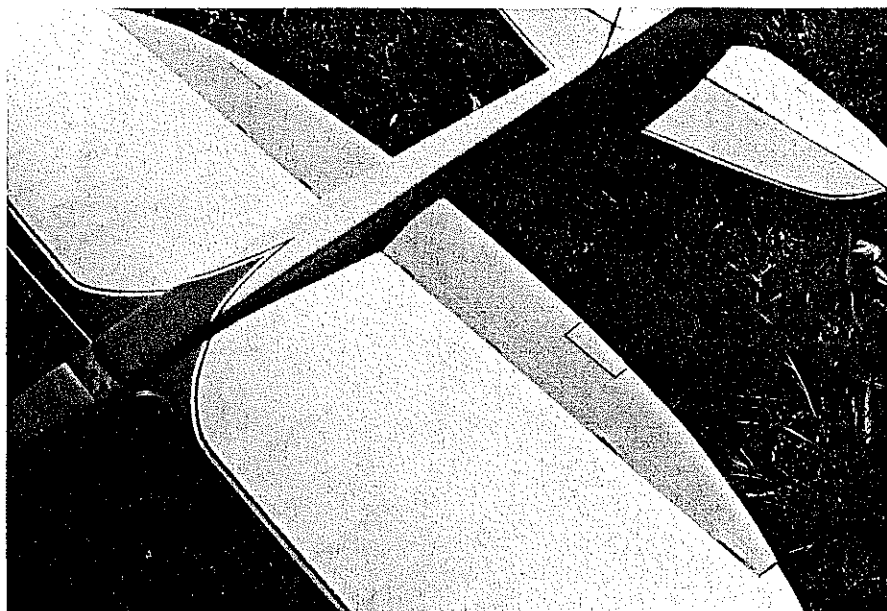
SHEET 3 OF 3

ALL DIMENSIONS FOR ORIGINAL COO
 UNLESS SHOWN OTHERWISE
 AT ALL CORNERS AND JOINTS

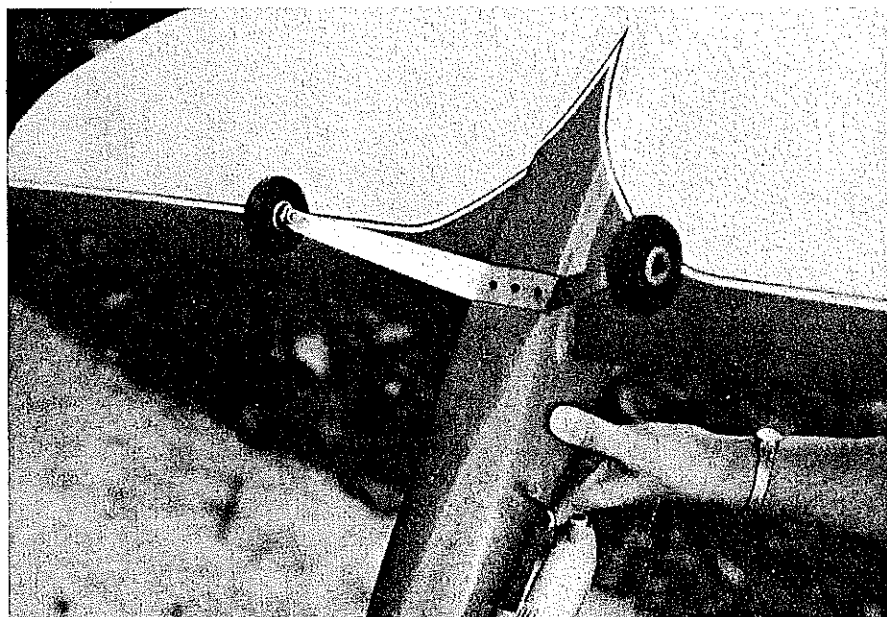
ALL DIMENSIONS FOR ORIGINAL COO
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SEE FUSELAGE SIDE VIEW FOR AIRFOIL SECTIONS



Taped hinge lines, visible here, add lift by increasing the efficiency of the flaps. Author used Graupner hinge-sealing tape, available from Hobby Lobby, for this part of trimming process.



Landing gear has been moved rearward of the original. Stock Magnum muffler replaced a 1/2-oz. lighter Merco unit to trim out increased sensitivity and make for a quieter flight.

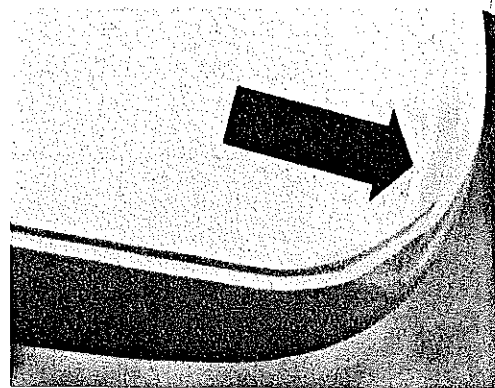
Since I worked in the wind tunnel, I had the opportunity to observe and to talk to the engineers about turbulence that was apparent on wing tips and at the high point of the airfoil. All the engineers said the British Spitfire had the most efficient wing shape; so I went to the elliptical tip shape and airfoil with an aft high point to reduce the turbulence. When I first flew the Smoothie, it sure lived up to its name. It was definitely smooth—even in high winds. It wouldn't turn tight, though, and I was disappointed.

"Later, when the Pattern requirements changed from a 60- to a 45-degree elevation, I needed a new and better plane—one that could make the tighter turns now necessary. This plane was the first Thunderbird. It had a thicker and better airfoil and a better planform. The earlier design had had an Orwick .32 on glow.

"... From the first flight it worked fine... Each flight demanded another and another..."

The old-style Thunderbird is the plane I have been using in my logo, so it seemed appropriate to build one of the first-version planes just to have on hand. The model you see presented here was built to conform to contemporary standards, but the wing and tail areas of the original have been maintained. Moment arms have been lengthened, the wings have been made of equal size, and the control system uses a one-to-one flap-to-elevator ratio. The landing gear has been moved rearward and Gieskieized for better landings. (For all you non-Stunters out there, that's with a nod and a tip of the hat to famed Stunter Bob Gieskie.—Ed.)

When these photos were taken, I'd been



Old-fashioned adjustable tip weight. Covering was cut, the weight inserted and the opening reglued with Ambroid.

flying the model for over two years—mostly for fun. I felt that it wasn't quite precise enough for competition, so just for experimentation's sake I tried two new trim changes.

The first was to seal the hinge lines using Graupner hinge-sealing tape (available from Hobby Lobby). This didn't much quicken the turn rate but did appear to add lift by making the flaps more efficient. Before the sealing, the plane had a tendency to *settle* in consecutive maneuvers.

The slight increase in sensitivity was re-trimmed out by adding a stock Magnum muffler in place of the 1/2-oz.-lighter Merco unit that had been on the plane before. In addition, the Magnum muffler was much quieter—a nice plus.

A second change that helped to wake up the model was the addition of a 9 1/2 x 6 1/2 four-bladed Bolly prop. This prop gave much more usable thrust, but without the speed buildup that other props had given. Prior to using the four-blade, I'd settled on a Bolly 10 x 6 1/2 three-blade as a best compromise. Switching the three- for the four-blade made the plane feel like I'd changed engines

Continued on page 160



Photo of the original T-Bird and its designer Bob Palmer at the 1989 Vintage Stunt Championships, Whittier Narrows, CA. The memento, a gift, occupies a place of honor.

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one button, and walk away. The charger fills your cells at 450-mA rate, then senses when your pack is full and switches to a trickle charge rate. I also like the ability to use my wall socket at home and a 12-volt car battery at the field.

As I mentioned before, I use the JR X-347 in the Whisper. This radio is set up for Aerobatics, Helicopters, or Sailplanes all in one transmitter. The X-347 is a computer-style radio featuring a transmitter microprocessor for control adjustments and mixing functions. The X-347 instruction manual is a staggering 116 pages of detailed, easy-to-follow instructions. While not a PCM 10, it is a definite step above the middle-of-the-road Heli systems.

The programming features of the X-347 when used for Helicopters give you three five-point main-rotor pitch curves, three five-point throttle curves, throttle hold with separate pitch curve, two revo-mix settings (hover and aerobatics), a.c.c. mixing, inverted-flight switch, free mixer, hovering pitch and throttle adjustment, collective pitch trim, and two- or three-servo c.c.p.m. mixing.

With all those features and the JR easy programming format, the X-347 should prove to be very popular. I know I really like mine, it's just so natural to use.

Obviously, the X-347 is a whole bunch more radio than the Whisper needs, but it has worked really well, and I intend to do a how-to-set-this-radio-up article in a future column.

Flying the Whisper is a neat experience. No starter, fuel, or smoke. It's very delightful to walk out in your front yard, turn on your machine, and fly away.

Here are some things to remember:

- The Whisper likes rpm, but be careful of overspeed. After four minutes of flying around, stay close to the ground. The power from the 1,100-mAh pack drops off fast, and it is possible to be flying (particularly in wind) and not have enough power to land without a boom strike.
- I would suggest investing in an autorotation clutch. This allows you to stay up longer and gives smoother flights.

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• The main rotor blades should be kept fairly loose. If you start up too abruptly, you can have a blade lag, and if it's too tight, the blades will stray out of track.

Obviously, there will be more to learn about electric-powered Helicopters. Great Planes will start delivery of the Concept EP next month. And coincidentally, next month we'll try out an EP and report on it.

Futaba and Airtronics are both working on Electric Helicopter systems. Bob Boucher of Astro-Flight is working on hop-up power plants.

All this activity tells me that Electric Helicopters have finally made it. This is great, especially since if all these follow-on products are anywhere near as good as the Whisper, we're in for some real fun. So stay tuned. As the plot thickens, you can read it here.

In summary, the Whisper functioned exactly as advertised. It went together very well, and it flew without a hitch. It's very stable and capable of mild aerobatics. Mine weighs 2 1/2 lb., and as a result is not really the greatest when flying in a wind. However, it is wind-capable, especially if you use idle-up to keep the rotor speed constant. Parts are reasonable and available. In a nutshell, Kalt has a winner in its new Whisper.

BCNU

Thunderbird/Dixon

Continued from page 62

from a .35 to a .45.

The Magnum .40 GP has no trouble pull-

Continued on page 164

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36 Westind Lyzander	25*618	37*624	75*838	100*852	
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25 C.Racer R3C-1	12*615	16*620	32*830		
34 Doug Transp DC-3	16*640	24*650	48*860		
33 Curt Hawk P-6E	15*615	23*622	47*834	63*850	94*868
32 Doolittle GPH11	12*617	18*622	37*835	49*846	74*858
31 Bee P4B-36A P12B	15*616	22*620	44*832	59*844	89*858
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ing the prop. It runs in a solid four-cycle everywhere, and only breaks into a two-cycle in maneuvers. The four-blade is also a good deal quieter. I use a ground rpm setting of 8,100 (16,200 on the tach), and in flight it is so quiet I can hear people talking outside the circle.

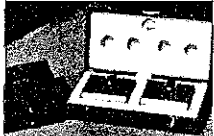
The plans are drawn using the revised fuselage and other changes noted above, as well as the original Veco kit dimensions. Decide which one you want before beginning, or build both. A project of this significance deserved the best, so I enlisted Steve Buso to do the plans. Besides being a decent Stunt flier and all-around modeler, Steve is a real artist. In Tivoli, NY his name is synonymous with modeling.

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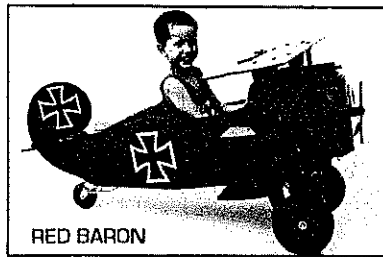
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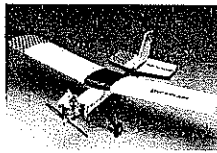
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rience I've had with Palmer-designed models came in February of 1989 at the first Vintage Stunt Championships in California. It was there that I met Bob Palmer for the first time. Imagine my pleasure and surprise when he asked if I'd like to have a photo of the original Thunderbird.

I said, "Sure, Bob," thinking of the usual snapshot. Instead, he presented me with an 8 x 10 studio glossy, autographed and with full information about the plane on the back. What an incredible surprise. The original print now hangs in a place of honor in my den (see photo). Thanks, Bob. I'm flattered and honored to receive it.

Construction. Unlike other elliptical-wing T-Birds, this one does not have to be built in a jig. I would, however, recommend using one.

Carefully pin the ribs into the notches in the trailing edge (TE), then add the rear and main spars, and finally the leading edges. Pin or tape everything into place.

Align all the ribs, and when you're satisfied with the alignment, hit all the joints with gap-filling Zap. Add the TE tip sheeting and the LE sheeting; then add the tips and tip blocks. The bellcrank can be installed either before or after sheeting the leading edge.

The kit-type plywood platform is shown on the plans, but I use a foam-wing-style bellcrank mount. If you are building the kit version, do use the 3/4:1 flap-to-elevator ra-

tio, and set up the system so that about 45 degrees of bellcrank movement gives about 30 degrees of elevator movement. A four-inch bellcrank might be a good idea in this case. I think that the original kit hookup is too quick unless a very narrow spacing is used.

Remaining construction is straightforward. You might be tempted to leave the helmet off the cowl to expose the engine. Lots of T-Birds were built that way back in the Fifties, but I prefer to keep the helmet. That cowl is an integral part of the character of the design.

The replica version of the T-Bird meets the new PAMPA rules for Nostalgia Stunt. The

Continued on page 167

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revised version does not. For a full set of these rules and other PAMPA literature, contact Tom Morris, PAMPA secretary, at 1019 Creek Trail, Anniston, AL 36206.

Finally, I'd like to again thank Bob Palmer for his contributions to the history and beauty of Control Line Aerobatics. You've left an indelible mark on the sport, Bob, and given many people great pleasure!

CL Aerobatics/McMillan

Continued from page 63

or slower? Most fliers seem to settle in at a lap speed somewhat faster inverted (about a tenth of a second) to help in particular maneuvers like the vertical eight and square eight. I should point out that if you weren't timing, it would be extremely difficult to sense the small differential, let alone make the adjustment. The airplane would know and those maneuvers wouldn't be quite as clean.

The watch can also let you know that there is a problem. Given that your setup is the way you like it, your flights should always be within a tenth of a second of each other, under good weather conditions. If everything is running well and the watch detects a growing variation with no real cause, you better start looking for something. Try a new plug if the current one has been in the engine for a long time. Usually that will settle things down. Also consider the fuel as a potential source of difficulty. Old fuel, or fuel from a partially empty can that hasn't been used in weeks can create subtle problems.

Duration changes can also be a good indicator of an engine's health. If you notice a lengthening run for no reason, it can point to a failing com-

pression seal. A gradual lessening of power is also an indicator, but you might not notice this as quickly because you compensate by turning up the engine a few more revs. The thing to do is monitor this carefully and consider an engine change if the condition worsens.

The bottom line is that these techniques can be a valuable tool to help you when you aren't flying your best.

Tech tip: Doug Dahlke wrote in response to the tip I had in a previous column on control system lubrications. He suggests using 90 weight, lithium-based auto chassis lube (with or without graphite or teflon powders). This is what I have been using. Also, I have a friend who swears that automotive wheel bearing grease (with or without graphite or teflon powder) is the way to go.

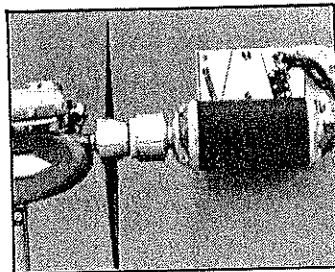
I haven't tried either of these, but they should

work. The tough part is to get the lube into the whole mechanism and keep it there for the life of the plane. ■

CL Scale/Boss

Continued from page 64

The board is also equipped with three twisted leads (red, black and orange) that would normally be used with a transmitter for battery supply and signal path to the RF section. Since we have no need for them in our current project, the twisted red and black leads (marked with an X in the sketch) can be cut off close to the board or removed. The orange lead will be one of our signal leads and must be retained. Please note that all other wire colors used in the sketch were chosen arbitrarily for purposes of clarity and explana-



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- Your face is not over the propeller.
- Mounts on most field boxes.
- To start: engage the prop. spinner to starter. A slight down pressure starts the engine. The field box won't move.
- Your start motor installs quickly on the SAFE-START ADAPTER.

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